

REMARKS

Claim 8 has been amended to recite that the sealing material comprises a perfluoroelastomer and an inorganic filler, the inorganic filler consisting of a crystalline carbon allotrope having an average primary particle size of at most 0.1 μm . Support for the “perfluoroelastomer” is found at page 3, lines 15-16 (the fluorine-containing elastomer is preferably a perfluoroelastomer). Support for the latter amendment is found at page 6, lines 8-15 of the specification. Namely, the description that the elastomer composition can include further a metal compound inorganic filler in addition to the carbon allotrope having an average particle size of at most 0.1 μm also describes the carbon allotrope as being an “inorganic filler.” As recited in amended claim 8, any and all inorganic filler incorporated into the sealing material is limited to a crystalline carbon allotrope having an average primary particle size of at most 0.1 μm .

New claim 16 recites that the sealing material does not contain an inorganic filler other than the crystalline carbon allotrope having an average primary particle size of at most 0.1 μm . Amended claim 8 and new claim 16 are believed to be of the same scope. As claimed in new independent claim 17, the sealing material does not contain a metal compound inorganic filler. Support is found at page 6, lines 2-15 of the specification. Particularly, because “metal compound inorganic filler” is positively recited in the specification, it may be explicitly excluded in the claims (MPEP § 2173.05(i)).

Review and reconsideration on the merits are requested.

Claims 8, 9 and 11 were rejected under 35 U.S.C. § 103(a) as being unpatentable over RU 2164524 C1 (RU ‘524) as evidenced by U.S. Patent 5,482,695 to Guschin et al in view of Drobny “Technology of Fluoropolymers,” 2001 CRC Press, pp. 103-104.

RU '524 was cited as disclosing a rubber mix comprising a fluorine-containing elastomer and impact detonation diamond graphite for use as a coating. The Examiner relied on Guschin et al as disclosing that the size of the diamond after detonation is from 40-120 Å. Drobny was cited as teaching that perfluoroelastomers are useful as coatings or sealants. The reason for rejection was that it would have been obvious to substitute a fluorine-containing elastomer of RU '524 with a perfluoroelastomer of Drobny because Drobny suggests that perfluoroelastomers are particularly suited for extreme service conditions.

The rejection should be withdrawn because the rubber mix of RU '524, even if modified to substitute a fluorine-containing elastomer of RU '524 with a perfluoroelastomer of Drobny, is outside the scope of amended claim 8. This is discussed in further detail below.

As claimed in amended claim 8, the sealing material of the present invention comprises a perfluoroelastomer and an inorganic filler, the inorganic filler *consisting of* a crystalline carbon allotrope having an average primary particle size of at most 0.1 µm. On the other hand, the rubber mix of RU '524 used as an anti-friction metal and rubber coating contains various metal compound inorganic fillers, such as magnesium oxide, barium sulfate and calcium fluoride as essential components. Claim 8, as amended, *excludes* the metal compound inorganic fillers described in RU '524. If included in the sealing material of the invention, the metal compound inorganic filler would impair and significantly degrade the plasma resistance of a molded article made from such a composition. As shown in Table 1 of the present specification, the weight in composition of Comparative Example 2 which includes alumina AKP-G008 is considerably decreased when exposed to NF₃ plasma, O₂ plasma and CF₄ plasma. Therefore, plasma resistance of all types is not improved when the metal compound inorganic filler is present. In RU '524, there is no disclosure of using the specific inorganic filler defined in present claim 8.

There is only a description of an elastomer composition which includes metal compound inorganic fillers excluded from present claim 8.

The reason for rejection was that it would have been obvious to substitute a fluorine-containing elastomer of RU '524 with a perfluoroelastomer of Drobny. However, even if such substitution is made, the resulting rubber mix containing various metal compound inorganic fillers as essential components, would not meet the sealing material of claim 8 comprising a perfluoroelastomer and an inorganic filler, the inorganic filler *consisting of* a crystalline carbon allotrope.

Turning now to combination of RU '524 and Drobny, Drobny only discloses a molded article of a perfluoroelastomer which can generally be used for sealing materials such as an O-ring. There is no disclosure or suggestion of employing a crystalline carbon allotrope having a specific average primary particle size in combination with a perfluoroelastomer to obtain the marked effects of the invention such as a little weight change upon exposure to all of NF_3 plasma, O_2 plasma and CF_4 plasma carried out in a process of manufacturing a semiconductor, especially a chemical vapor deposition (CVD) process. RU '524 also does not disclose employing a crystalline carbon allotrope having a specific average primary particle size together with a perfluoroelastomer to obtain such marked effects.


Therefore, the sealing material of the present invention cannot be readily obtained by those of ordinary skill in this field of art based on the disclosures of the cited references.

For the above reasons, it is respectfully submitted that the amended claims are patentable over the cited prior art, and withdrawal of the foregoing rejection is respectfully requested. Withdrawal of all rejections and allowance of claims 8, 9, 11, 16 and 17 is earnestly solicited.

In the event that the Examiner believes that it may be helpful to advance the prosecution of this application, the Examiner is invited to contact the undersigned at the local Washington, D.C. telephone number indicated below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



Abraham J. Rosner
Registration No. 33,276

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE

23373

CUSTOMER NUMBER

Date: April 23, 2010